APRIL 1967
VOL. 32 NO. 9

Soil Conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

EXPANDING ROLE OF WATERSHED PROJECTS

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SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE

Evolving . . .

The locally sponsored project, as evolved in small watersheds, is proving a practical way to get difficult conservation jobs done.

We see the extension of the idea in multicounty Resource Conservation and Development Projects. Local leaders who learn to see resource problems in their entirety, and who gain experience in small watershed projects, soon see the opportunities for community action on a larger scale.

Project Coordinator Rollin Swank in our lead article (p. 195) traces such a development in the Penn Soil Project.

Complete: At the same time, small watershed projects are evolving toward more complete action within their own boundaries.

Once damaging floods are brought under control, local people see many ways to improve their use of water (and land) resources, as in the Georgia example reported by State Conservationist Cecil Chapman (p. 202).

The same type of community action that can build floodwater-retarding structures can plan and build other facilities to increase water supplies, improve quality, or meet other local needs.

Critical Areas: Just such project action is what Administrator Williams sees (p. 215) as a cure for critical erosion areas—roadsides, streambanks, strip-mine spoil, and the like—now bypassed by individual action.

COVER: A multipurpose floodwater-retarding structure and land treatment on the Frye Creek-Stockton Wash watershed protects Thatcher, Ariz., from floods originating in the mountains in the background.

Soil Conservation

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SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

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Prepared in the Division of Information, Soil Conservation Service,
U. S. Department of Agriculture, Washington, D. C. 20250

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Subscription: $2.00 per year, $2.75 foreign. Single copy, 20 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

Watershed projects lead to broader goals

THE TREND toward multiple purpose objectives in watershed treatment demonstrates the feasibility of dealing effectively with all aspects of water management in projects under Public Law 566 and in the 11 authorized river basins.

Project plans most recently approved for operations show local sponsors becoming more and more aware of how water and related land resources can be grouped in a watershed community. The articles in this issue of SOIL CONSERVATION *give a fair sampling of the variety of purposes that can be blended into practical watershed-treatment programs.*

New public recreational facilities are currently being installed in 108 watershed projects in 33 States that will supply an estimated 7 million user-days of recreation a year. Plans for more than 130 watershed reservoirs include provision for municipal or industrial water-supply storage.

Irrigation, drainage, and fish and wildlife improvements have been part and parcel of intelligent watershed planning for some time.

Broad studies of our resource development needs—in river basins, for example—are now going on, and Public Law 566 projects are beginning to reflect their findings. In one project, planners are checking the feasibility of including measures for recharge of groundwater aquifers. In another, recently approved for construction, water will be stored for later release as needed to augment streamflow to maintain water quality.

The outlook is for continuing attention to broader resource-development possibilities in America's "can-do" watershed program.

HOLLIS R. WILLIAMS
Deputy Administrator for Watersheds

Local Leaders Expand Aims In Penn Soil RC&D Area

By Rollin N. Swank
Project Coordinator, SCS, Mercer, Pa.

WATERSHED projects have formed a base for broader resource planning in the Penn Soil Resource Conservation and Development Project.

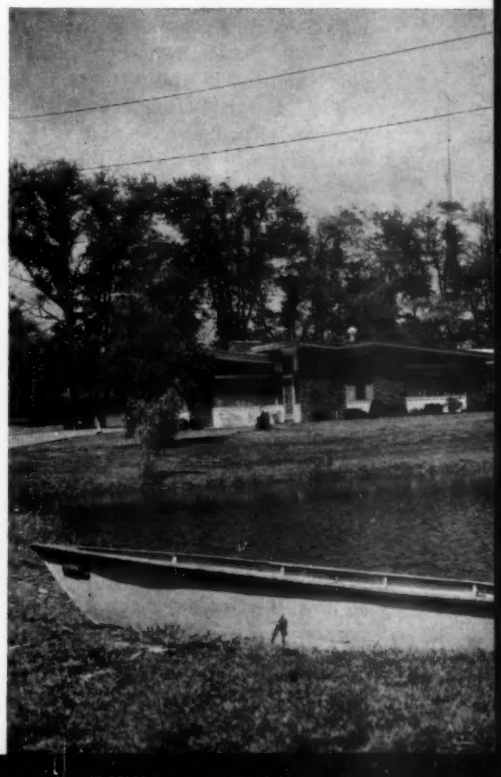
Six active projects under Public Law 566 gave an early boost to RC&D efforts in Crawford, Mercer, and Venango counties, Pa., by demonstrating the benefits of resource improvement and by developing community leadership. Many people who became active in the watershed projects are now the key leaders in the RC&D Project.

The watershed projects also helped to knit the three counties together. Severe floods of 1958 and 1959 proved that raging waters paid no attention to manmade county boundaries. As county commissioners and soil and water conservation district directors met to discuss and plan how to cope with the flooding problem, a strong bond developed among them. These local leaders became interested in and concerned with other common problems and opportunities, such as revegetation of strip-mine spoil, keeping farmers on the land, new recreational ventures, and other opportunities for resource development.

These broader challenges did not stop at natural watershed boundaries. It was apparent that if progress were to be made in developing all of the resources, the entire area would have to be considered.

Mill Run

A good example of watershed stimulus to the Penn Soil RC&D Project is the Mill Run Watershed Project in Crawford County. This project protects the community of Meadville, which suffered



Recreation is one of the resources being developed by the Penn Soil RC&D Project.

Members of the Planning Commission staff, Michael Willard (left) and Arlie Reagan, study a township plan with RC&D Project Coordinator Rollin Swank (right).

$170,000 worth of flood damages from Mill Run in 1956 alone.

The Mill Run Project contains needed land-treatment measures and two flood-prevention structures. A unique multiple-purpose reservoir, Tamarack Lake, is formed by dams across two streams through a large swamp. The 4-mile-long lake covering 580 acres provides excellent fishing waters for area sportsmen at minimum cost.

The Pennsylvania Fish Commission helped develop this recreational lake by securing the necessary land rights and maintaining the lake after its completion. Its success as a recreational area is attested to by the line of cars around the lake from early afternoon to late evening.

Oil Creek

The Penn Soil RC&D Project sponsors and committees working on the plan recognized that full resource development of the area would be the springboard for achieving economic growth. The Oil Creek Watershed Project above the city of Titusville is an example of how the project meets their objectives.

Seven structures provide flood protection for the business district of Titusville and industries along Oil Creek. Industrial growth resulting from the project is expected to bring jobs for 700 more people in the next 5 years.

The project also will protect the million-dollar Drake Well Museum and State Park, site of the drilling of the world's first oil well. More than 100,000 people a year are expected to visit the museum and nearby Pithole City, an oil boom town that flourished briefly into a community of 10,000 people around 1865.

Local sponsors have applied for a loan of $218,000 from the Farmers Home Administration to acquire the land rights for project development in this watershed. Total estimated cost of the watershed project is nearly $2 million, and average annual benefits $102,400.

Saul-Mathay

Two flood-prevention dams in the Saul-Mathay Watershed Project protect the east side of Greenville in Mercer County. These dams, plus 6 others planned in the Little Shenango River watershed have influenced 2 industries employing 1,200 people to remain in the community. Floods in July 1958 and again in January 1959 had caused several industries to consider relocation unless flood prevention was provided.

These industries now are expanding operations. The Hempfield Township supervisors are presently working on a township park to be built at the Saul site of the Saul-Mathay watershed.

Little Shenango River

In the Little Shenango River watershed, the Chicago Bridge and Iron Company and the Bessemer and Lake Erie Railroad, are helping pay for construction of structures to protect their industries from flood damage.

The Pennsylvania Game Commission is assisting in development of a 652-acre impoundment for waterfowl habitat just south of a 2,500-acre goose management area on Pymatuning Lake. The Biology Department of Thiel College plans to use the sediment pool of one structure for student experiments in wildlife habitat.

Sandy Creek

The Sandy Creek watershed work plan includes a floodwater-retarding structure above the borough of Stoneboro and a long-sought multiple-purpose dam that will store 1,750 acres of water for recreational use above the community of Sandy Lake. Construction of the dam will be started in 1967.

The land for this project is being acquired by the State agency under "Project 70," a Pennsylvania land-acquisition program.

With the promise of flood prevention on Sandy Creek, the community has taken on a new outlook. The Clinch-Tite Corporation, a local wood-using industry, has expanded its operations to employ

more than 50 people. Kemco Corporation, located on the Sandy Creek flood plain, has received a $30,000 loan to double its productive capacity and will soon employ 27 more people. There is an air of confidence among the local merchants.

Other RC&D measures

The Penn Soil RC&D sponsors have included in the plan the planting of trees, shrubs, grasses, and legumes to stabilize critical sediment-producing areas. RC&D funds are provided for buying needed planting materials. Under the leadership of the Mercer and Venango County soil and water conservation districts, this critical area planting started in the spring of 1966. The goal is to plant approximately 3,000 acres of strip-mined land in the area, to control erosion and reduce sedimentation.

In Venango County, Boy Scouts helped pay their way to summer camp by planting trees on Saturdays. In Mercer County, underprivileged boys planted trees and gained valuable experience as well as pay.

The landowners received cost-sharing aid from the Agricultural Conservation Program and more financial help from two private electric utility companies. SCS assisted with the planning, and the Pennsylvania Department of Forests and Waters aided in supervising the planting.

Another goal of the Penn Soil RC&D Project is acceleration of the land-treatment program in the three-county area. A great deal of conservation work has been completed, but much remains to be done. The installation of contour strips, diversion terraces, waterways, and wildlife areas is essential to the total development of the area's resources.

Last year, SCS helped 572 landowners develop conservation plans as cooperators with soil and water conservation districts. Conservation farming is still the best way to insure beautiful open space for this and future generations.

Numerous private developments are now getting underway in the RC&D area. Ed Chadderton, for example, has shifted his 572-acre farm from agriculture to income-producing recreation. He formed a corporation that has built an 18-hole golf course on the farm. A large impoundment site and two smaller dams will serve as hazards and provide irrigation water for the course. Plans include residential development of about 400 lots around the golf course. Approximately $1 million will be spent in the conversion.

Urbanization is bringing new opportunities and new problems to the RC&D Project area. There are eight interchanges on the interstate system being built in the three counties. SCS is furnishing soils interpretations to land owners and developers to be used for planning of building sites, sewage systems, and road layouts.

An accelerated soil survey of 157,000 acres of land undergoing urbanization in Venango and Mercer counties is being financed in part under Section 701 of the Housing and Home Finance Act to provide information for local people to use in planning developments. During the past year, SCS provided 53 developers and subdivisions with resource information on which to base their land use decisions.

Another outstanding RC&D Project measure is the Penn Soil Conservation Education Center at Rocky Basin, a beautiful hemlock gorge just off the interchange of Interstate Highway 79. The little community of Sandy Lake, population 873, raised $42,000 to purchase the 205-acre site after Turner Craig, president of the local bank and a member of the Education Committee of the RC&D Project, interested the sponsors in the proposal.

A conference auditorium, dormitories, libraries, and other facilities will make this a true conservation education center. The entire 1½-million-acre Penn Soil RC&D area will be used to demonstrate conservation at work and develop a conservation conscience in the community. The sponsors are working with a local college to put the center into operation.

The sponsors believe that the people of the area and the leadership they provide are their most important resource; that natural resources are important only as they affect the people. The RC&D Project provides opportunities to use the leadership and find new ways to make resources meet the needs of the people. ♦

The expanded operations of a pallet-making plant in Sandy Creek watershed will employ 50 additional people.

The town of Thatcher lies on a plain at the foot of the mountains.

Taming of Flash Floods Gives Desert Towns Chance to Grow

By James Ferrin
Work Unit Conservationist, SCS, Phoenix (formerly at Safford), Ariz.

HEAVY RAINS deluged the mountains, hills, and terraces above Safford, Ariz., in December 1965.

Afterwards, the mayor of Safford, Charles Kirtland, reported thankfully that his city and surrounding farmlands of Graham County had been spared more than $125,000 in damage from floods.

The mayor said the Stockton Wash dam and channel, completed in February of that year, held back a flood of more than 1,000 acre-feet of water, with no damage to the structure or the protected area below it.

Stockton Wash was the last segment of Frye Creek-Stockton Wash Small Watershed Project. Safford, neighboring Thatcher, Graham County, and Gila Valley Soil Conservation District were local sponsors of the project. Soil Conservation Service provided financial and technical assistance.

The Frye Creek-Stockton Wash Small Watershed Project was authorized by Congress in June 1959, after nearly 5 years of organization, planning, information-gathering, and other preparation. It involves 153,714 acres—58 percent Federal land and 42 percent private and State land and cost $3,609,000.

The local sponsors provided rights-of-way, administration, and $491,000 of the total cost. They operate and maintain the facilities.

Watershed planners estimate that benefits of the project will outweigh costs by 2 to 1.

The towns, the county, and rural

Before Frye Creek was tamed by a floodwater-retarding dam, runoff from summer storms spilled over into the streets of Thatcher, Ariz. At Safford, (right), Graveyard Wash is subject to flash floods from the mountains above the town.

A Little League baseball team sponsored by the Gila Valley Soil Conservation District takes part in a tournament on the new recreation area in the shadow of the Frye Creek floodwater-retarding dam.

landowners are enjoying a surge of flood-free economic activity.

Farmers are improving their facilities and operations with confidence that they won't be undone in the next storm.

Thirty new homes have been built on property now protected by the Frye Creek segment of the project and at least that many under the Graveyard Wash segment. A new motel, cafe, grocery store, service station, barber shop, and post office building have been constructed. A new motel, a new farm machine business, a new car dealership, and new office building have been constructed in the Safford area.

The annual cost of maintaining Graham County's road system has been greatly reduced, county officials report.

Eastern Arizona College has opened up a 35-acre addition to the south on what was formerly cotton land subject to almost annual flooding. New facilities worth $1.5 million have been constructed and more are in the building and planning stage: Gymnasium, athletic fields, and classrooms.

Two Little League ball parks built in the shadow of the Frye Creek structure are providing much-needed recreation facilities for the entire valley.

A new Graham County Mounted Sheriff's Posse rodeo arena, with seating on the face of the same dam, is providing another much-needed facility.

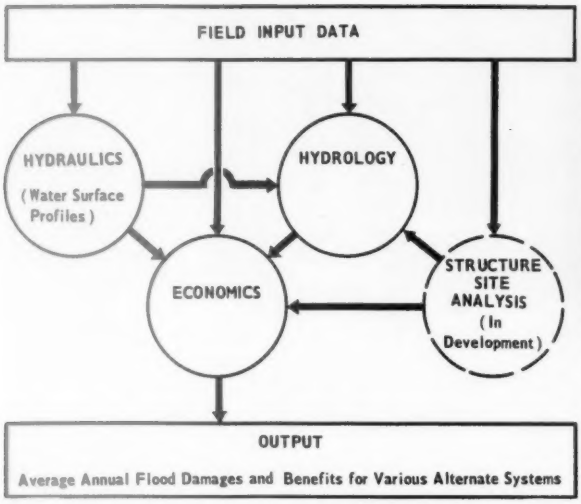
Support for the Frye Creek-Stockton Wash Project began to take shape after a bad storm in 1954. The late J. David Lee, chairman of the Gila Valley Soil Conservation District, proposed a project under the Watershed Protection and Flood Prevention Act.

Mayor Nat Hoopes and the city council of Thatcher; Mayor Osgood Rawson and his successor, Charles Kirtland, and the city council of Safford; Graham county supervisors headed by Vearl Lines; and the Gila Valley District board of supervisors got behind the idea and pressed it forward.

Now Graham County Manager H. C. Gietz says, "Each day we realize more and more the advantage of this project. The people of our community are continually relating to the board how happy they are with this project. The protection afforded by the flood-control dams and channels has saved many hundreds of dollars."

Says Eastern Arizona College President Dean A. Curtis:

"The flood-diversion dam made the expansion of the South Campus feasible. Prior to the completion of this project, the area of the South Campus (then a cottonfield) suffered almost annual damage as a result of flash floods coming down the large sand wash. Building the facilities of the South Campus has enabled the curriculum of the institution to grow with the increasing enrollment of the college." ♦



The chart shows the flow of data and relationships between the four project formulation programs for watershed planning. At right is a view of the electronic computer room in the Washington Data Processing Center of the Statistical Reporting Service.

Summary of Watershed Project Formulation Programs

Input data	Output options
Hydraulic (Water-Surface Profiles)	
(1) Cross-section coordinate data. (2) Channel length. (3) Flood-plain length. (4) Manning's "n" values. (5) Starting water-surface elevation. (6) Drainage areas.	(1) Elevation-discharge-area inundated data for 1–240 cross sections and 1–15 water-surface profiles. (2) A summary rating table of elevation, discharge, cross-sectional area, and area flooded. (3) Item (2) plotted as elevation-discharge curve. (4) Item (2) punched out on cards ready for use in both Hydrology and Economic programs.
Hydrology	
(1) Rainstorms—up to 9 actual or assumed distributions. (2) Water-surface elevation versus discharge rate and cross-sectional area for as many as 120 reaches. (3) Elevation versus spillway discharge rate and storage for as many as 60 floodwater-retarding structures. (4) Drainage area, watershed runoff factor, and watershed time-of-concentration for the subwatershed areas. (5) Length of each reach. (6) Elevation at which reservoir-flood routing begins. (7) Base flow amounts at each reach. (8) Proposed alternatives in the cross section of channels in (2) above. (9) Proposed alternatives in storage and other characteristics of each structure in (3) above. Also changes of structures being included or excluded. (10) Changes in watershed characteristics affecting rate or volume of runoff.	(1) Peak discharge and crest elevation for each routing through each reach. (2) Peak rate of outflow and maximum water-surface elevation for each routing through each structure. (3) Up to 300 coordinates of discharge and time for each routed hydrograph through each reach and through each structure. (4) Up to 300 water-surface elevation and outflow discharge coordinates for each routing through each structure. (5) Total routed storm volume past each reach and structure location for each routing. (6) Either or all of (1), (2), (3), (4), and (5) can be obtained for an unlimited number of combinations of input-data, items 1 through 10.
Economics	
(1) Crops being damaged. (2) Unit prices for crops being damaged. (3) Distribution of floods by seasons. (4) Floods to be evaluated. (5) Distribution and yields of crops in the evaluation reaches. (6) Percent damage factors for each crop. (7) Other-agricultural and nonagricultural damage factors. (8) Elevation-discharge-area inundated tables for each cross section. (9) Elevation at which flood damage begins at each cross section.	(1) Acres flooded and dollar damages by increments and by storms for all cross sections, reaches, and entire systems. (2) Item (1) distributed as crop and pasture, other-agricultural, and nonagricultural by increments. (3) Average annual damages and benefits for item (2) by cross section, by reach, and for system. (4) Item (1) plotted as discharge-damage-frequency curve.

SCS Electronic Computer Program Expanded to Include Economics

By R. E. Maclay
Head, Central Technical Unit, SCS, Hyattsville, Md.

THE ECONOMISTS in the Soil Conservation Service have joined the engineers in utilizing high speed electronic digital computers for watershed planning.

SCS has made operational the third of its "Project Formulation" programs—the latest one dealing with economics.

The Hydraulics (water-surface profiles) and Hydrology programs are already operational (*Soil Conservation,* July 1964). The fourth, "Structure Site Analysis," is still in the developmental stage.

The Economics Program is designed to use hydrologic data from flood routing as part of the input data. It can be used, therefore, to appraise floodwater damages after the relationships between depth, discharge, and area inundated have been determined in the Hydraulics and Hydrology programs.

Crop and pasture, other-agricultural, and nonagricultural damages are computed. Some types of damage not correlated directly with flood peaks are not determined by the computer program. For example, damage from land voiding through gully encroachment or bank caving and from deposition of sediment has not been included in the program. At this time the program does not measure benefits from irrigation, drainage, or other types of land enhancement.

The electronic computer programs were developed primarily to improve the quality, but also to reduce the costs, of watershed projects by making it possible to analyze a larger number of alternative systems of structural measures. The Economics Program can evaluate damages and benefits for up to 99 alternative systems for a watershed in one "pass" through the computer.

The economist and hydrologist jointly prepare the input data for the computer. The data sheets are in a format with headings familiar to watershed-planning technicians, rather than in a complicated machine code. The outputs from the computer also are in notations familiar to technicians.

The computer program can handle computations for as many as 120 "evaluation reaches" for a watershed. The economist normally makes a new evaluation reach for each significant change in crop distribution, crop yield, other-agricultural, or nonagricultural damage factors.

The engineer provides the economist with data on the areas inundated at various flood stages at selected cross sections within each reach. The program uses these data, together with the damage factors provided by the economist, to compute the amount by which each of alternative flood-prevention plans would reduce flood damages.

The output data consist of crop and pasture, other-agricultural, and nonagricultural monetary damages for each expected flood. The damages also are stated in terms of average annual values. The benefits are stated as the differences between damages caused by floods without the project and damages that would occur with each alternative structural system considered.

The computer program provides considerable flexibility in the amount of output information one chooses to receive. Visual charts of certain outputs are also available through the computer.

The Economics Program, as with others in the project formulation series, can be used independently or in conjunction with the others. Generally, the programs are used in sequence, so experienced technicians can examine the output from one program before it is used as input to another program. The programs are compatible, however, to the extent that certain outputs from the programs can be produced as punched cards suitable for direct use as input to other programs.

The Hydrology Program has been used to process data for about 150 watersheds a year. It is estimated that the Economics Program will make it possible to use both programs with 200 or more watersheds a year.

Because of the limited number of watersheds to be processed each year in any one State and the small amount of computer time needed for each watershed, most of the work is done at a central location for efficiency in contracting for computer services.

Input data are sent to the SCS Central Technical Unit in Hyattsville, Md. The actual processing is done through facilities at the Washington Data Processing Center of the Statistical Reporting Service in Washington, D. C. ♦

Watershed Lakes in Georgia Create Recreation Opportunity

By C. W. Chapman
State Conservationist, SCS, Athens, Ga.

WATERSHED projects in Georgia are providing many economic and recreational benefits beyond their basic intent of preventing floods.

In the 44 projects approved for operations under Public Law 566, local sponsoring groups are working together to protect and improve the more than 2½ million acres involved and to take advantage of new opportunities thus created.

One example is the 130,000-acre Tobesofkee Creek watershed in Bibb, Lamar, and Monroe counties. Here, after providing for flood prevention by land treatment on the watershed and two upstream floodwater-retarding structures, the sponsors added a 1,707-acre reservoir for water supply and recreation near Macon.

This special-purpose lake was designed to have a nearly constant water level and to maintain the normal streamflow, thereby avoiding the common disadvantages to recreational use resulting from the alternate filling and emptying of floodwater-storage reservoirs. The industrial water supply and recreation facilities will benefit more than half a million people in middle Georgia.

The project is sponsored by the Bibb County Board of Commissioners, the Ocmulgee and Towaliga soil and water conservation districts, and the Rural Roads Authority of the Georgia Highway Department.

The Soil Conservation Service is helping the local people plan the project and supervise its construction and has provided a grant of about 49 percent of the total cost of $4.2 million. The Farmers Home Administration provided loans to finance the local costs.

In 1962 Bibb County officials, realizing the need for more recreation facilities for a rapidly growing population and expanding industry, decided the Tobesofkee watershed dam and lake would help meet these needs. A survey made by the county showed that there was no equivalent facility within a radius of 50 miles.

The nearness of the lake to Macon made the project particularly attractive to the local people, including a large number of military and civilian personnel at nearby Warner Robins Air Force Base.

The lake, just about a mile and a half from a new junior college that will be opened in 1968, is expected to be a big recreational attraction to the students.

Bibb County is developing three parks around the lake and is planning three others. The six parks will cover 636 acres, and their development will cost more than $600,000. They will include boat ramps, outdoor cooking grills, picnic tables and shelters, camping sites, and access roads to recreation areas.

The Georgia Rural Roads Authority and the Federal Government are building four bridges and raising another one. One road will be relocated. Fishing, boating, and other concessions will be leased to private operators.

Kenneth Carswell, chairman of the Bibb County Board of Commissioners, predicts that the lake development will attract home builders and industries. He estimated that 1,000 homesites would be available around the attractive lake when it is completed.

The lake will be 6 miles long and will have a 34.2-mile shoreline. It will have a storage capacity of 25,000 acre-feet or more than 8 billion gallons of water.

The twin automatic gates have openings 40 by 40 feet in size. Note the two men, suspended by the crane, putting finishing touches to one of the counterweights.

Many engineers, contractors, and others have visited the project to see the dam's unusual design and construction. It is said to be the only one of its kind east of the Mississippi and one of only a few in the world.

Built into the 49-foot high concrete dam are twin counterweighted gates that will automatically maintain the water in the lake at a constant level.

Counter weight floats built into wells at either side of the dam, raise or lower the gates as the water level in the lake fluctuates. The gates are so well balanced that they can also be operated manually if necessary.

A pipe 30 inches in diameter releases water from the top of the lake to maintain normal flow of the creek without using the gates and to avoid releasing very cold water from the bottom of the lake that might alter fish habitat downstream. Another 30-inch pipe can draw down 2 feet of water for industrial use in Bibb County.

The Bibb County government paid the entire cost of this pipe and for enlarging the dam to hold the additional 3,500 acre-feet of industrial water.

Some 24,733 cubic yards of concrete was used to build the dam. Because it was being built in the summer, 300 pounds of crushed ice per cubic yard of concrete was used to keep the temperature of the mixture at 55 degrees or below. Some 3,750,000 pounds of ice, bought locally, was used.

The overall length of the dam, including 115,000 cubic yards of earthfill, is 850 feet. The embankments will be grassed. Rock riprap was placed on the face of the embankments.

The Bibb County commissioners have asked the State Game and Fish Commission to stock the lake with bass and bream and to manage it for fishing. About 1,750,000 bream and 175,000 bass will be put into the lake as it fills. ♦

City Soil Survey Started

The Haverhill Conservation Commission gets a firsthand look at soil surveying from Robert N. Morehouse, work unit conservationist, SCS (on left) and Everett Francis, soil scientist, SCS, (center), at ground-breaking for Essex District's first city soil survey. Members of the commission are (from left), Jason Cohen; Godfrey Flagg; John Curtin; Richard Fletcher, chairman; and Norman Bailey.

THE Haverhill Conservation Commission, Mass., picked up some practical knowledge on soil surveying at a ground breaking for the city's operational soil survey.

Everette Francis, SCS soil scientist, assisting the Essex Conservation District, showed the commissioners various kinds of soil and explained their suitability for certain uses.

Francis pointed out an area that had severe limitations for septic tank effluent disposal because of a hardpan near the surface and a seasonally high water table.

One commissioner remarked, "Now I know why some homeowners have a lot of trouble with their septic tank systems."

Richard Fletcher, commission chairman, said he feels that better land use will be emphasized by the survey as it will reveal potential problem areas.

"Knowing where they are, we can avoid the problems and save the city money and headaches," Fletcher said.

The conservation commission plans to distribute copies of the soil survey report and interpretive maps to every city agency in Haverhill, the first community in the Essex District to undertake a survey.—ROBERT N. MOREHOUSE, *Work Unit Conservationist, SCS, Hathorne, Mass.* ♦

Farmland Converted to Recreation

J. W. Goode, a cooperator of the Lee Soil and Water Conservation District near Ft. Myer, Fla., has found it profitable to convert his pasture and woodland to recreational use.

In 1966, some 3,000 to 4,000 trailer buffs with their portable homes descended on Goode's Garden of Light for their mid-winter rally.

Mr. Goode has a soil and water conservation plan developed with the assistance of SCS, and his facilities include camper and trailer accommodations, nature trails, boardwalk, modern restrooms, hot showers, and lounge. ♦

Stubble Mulching Against the Wind

By Walter N. Parmeter
Conservation Agronomist, SCS, Huron, S. Dak.

FARMERS and ranchers in South Dakota have learned by firsthand experience that any loss of topsoil or moisture by wind erosion is serious business. That is why they have turned with enthusiasm to stubble-mulch farming and field stripcropping for controlling wind erosion.

During recent years, wind erosion has annually damaged topsoil on as many as 175,000 acres in South Dakota. It has caused additional losses by cutting off or covering up young plants of winter wheat, barley, and other crops.

Stubble-mulch farming means managing plant residues on a year-round basis. Seedbed preparation, planting, cultivating, and harvesting are done in such a way that plant residues remain on the surface and protect the soil from wind and water erosion until a new crop provides protection.

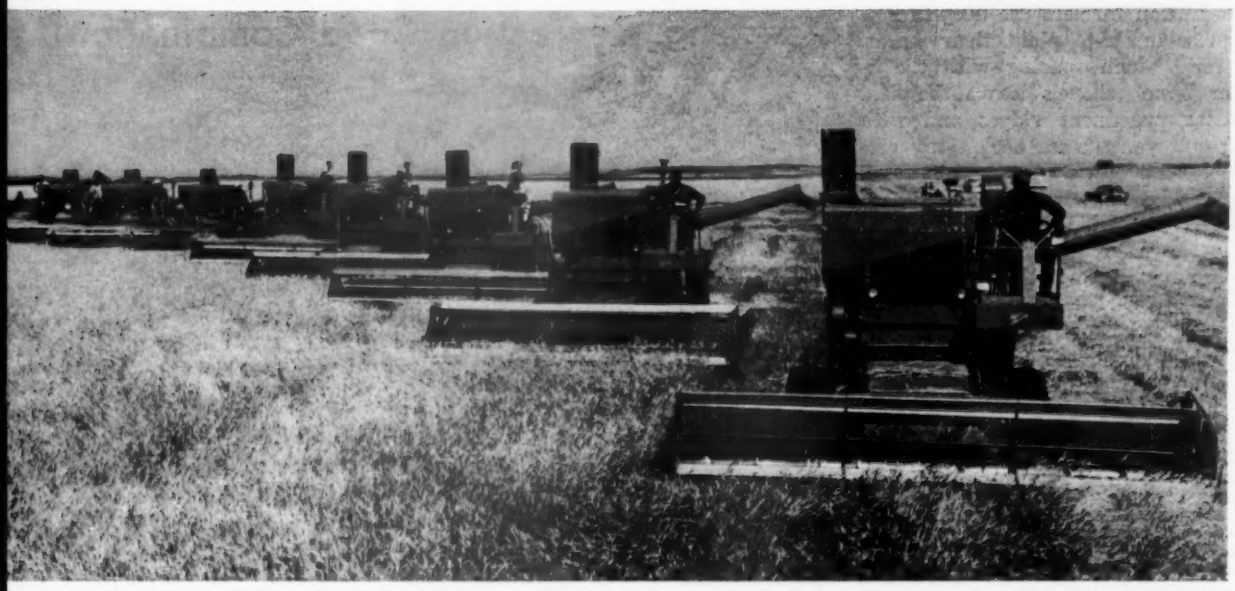
Demonstrations of stubble-mulch machinery staged by the Soil Conservation Service and Extension Service in the fifties showed the types of blades, deep furrow drills, and other equipment available for good stubble-mulch farming. Farmers who saw how the use of this machinery helped to control wind erosion and conserve moisture saw a new future in farming.

This type of deep-furrow press drill, used by the Asmussens, has 5-inch shovels alternating in two rows across the drill. The front row is 28 inches ahead of the back row, allowing the residue to pass between the shovels readily.

After 7 years of stubble-mulch farming, William J. Asmussen, a cooperator in the Sully County Soil and Water Conservation District, says, "Regardless of whether your ranch is large or small, when the seedbed starts blowing away, it's a loss you can't afford to take. It can be rapid or slow, but it is always permanent and can never be returned. I think it's high time for all farmers with wind-erosion problems to start a stubble-mulching program."

Asmussen and his four sons—Stanley, Bill Jr., Kenneth, and Irving—operate 41,120 acres of farmland of medium-textured soil that is subject to blowing when left bare. Since seeing the stubble-mulch demonstration in 1959, they have used the practice along with field strip-cropping, to protect their cropland.

The Asmussens and other con-



In the fall Asmussen Brothers' tractors (far left) sweep over the fields, each pulling two 6-foot blades that kill weeds and loosen the soil without covering the stubble. At harvest time, self-propelled combines reap the reward of stable soil and conserved moisture. Wind strip-cropping (below) on the Dave Cash farm alternates drilled milo and wheat with summer fallowed strips.

servation farmers use deep-furrow press drills to plant their wheat. The 14-inch spacing with the 4- or 5-inch shovels leaves the field with prominent ridges and with residue on the surface, giving protection against wind erosion until the wheat is tall enough to protect the soil from blowing.

These drills have the shovels in two rows, one 28 inches ahead of the other. The shovels are spaced alternately in the two rows, making 28 inches between shovels in either row. The heavy residues on the seedbed pass readily between the shovels without plugging the drill.

Blade-type plows are popular with stubble-mulch farmers. The Asmussens use two 6-foot blades on each tractor. The blades cut through the soil 3 to 4 inches under the surface, killing the weeds and leaving stubble and residues on the surface. Each plowing is performed in a different direction across the field.

Stubble mulching uses Nature's principle of keeping the soil covered with plants or plant residues. Surface residues intercept and disperse most of the erosive force of wind and of raindrops and permit water movement into the soil. ♦

The combination of ridges and residue on the surface after drilling of wheat protects the field from wind erosion. In the picture are (left to right), Robert Koerner, SCS work unit conservationist, William J. Asmussen, and Stanley Asmussen.

Ranching, Recreation Good Combination

Jean Taylor, son Raymond, and daughter Becky on irrigated pasture on the ranch. Ponderosa pines and San Juan mountains rim valley.

DISTRICT Cooperator John Taylor, Pagosa Springs, Colo., diversified his ranch operation to step up his income by adding the Ponderosa Trailer Park to his ranching enterprise.

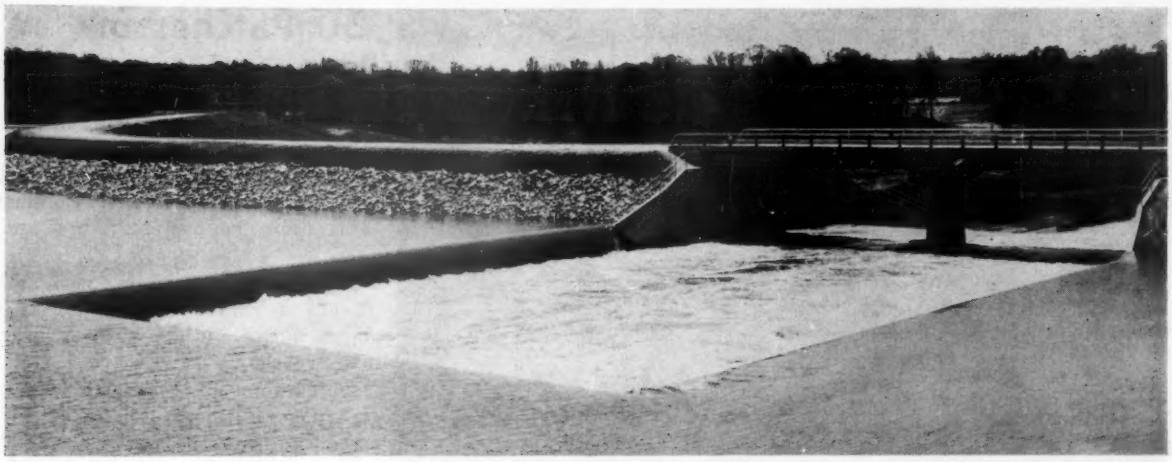
Fluctuating cattle prices along with the size of his unit—400 acres mostly in irrigated pasture—combined to limit his net profits.

One day John Taylor after watching thousands of vacationers travel past his ranch to go to the 325-acre Williams Creek Lake, created by the Colorado Department of Game, Fish and Parks, asked his wife Jean, "Why not provide facilities for these people to park trailers or pitch tents?"

Planning for the trailer park got underway in 1960. An architect and an engineering firm in their investigation conducted soil percolation tests, and they showed that the leach field Taylor wanted for the sewage system would not work. A septic tank and a lagoon system were installed instead.

Ponderosa Trailer Park went into operation in 1962. It has 15 spaces, equipped with water, sewage, and electrical hookups. A service building provides restrooms, showers, and a coin-operated, automatic washing machine. Shower facilities are free to park customers. Others may shower for $0.50 each.

As a cooperator of the San Juan Soil Conservation District, John Taylor will receive assistance from SCS in designing a pond. A trial planting of native grasses and flowers will be made by SCS.
—ROBERT W. DELZELL, *formerly Work Unit Conservationist, SCS, Pagosa Springs, Colo.* ♦



The concrete inlet and chute spillway of Lou Yaeger Lake is 103 feet wide and 357 feet long. Last spring it handled a 3.9-inch rain with ease.

Multipurpose Lake Ends a Long Water Shortage

THE 100-YEAR water crisis of Litchfield, Ill., is over, thanks to the Shoal Creek Watershed Project.

A new 1,412-acre multipurpose lake built under the Watershed Protection and Flood Prevention Act stores 14,000 acre-feet of water. That is 4,573 million gallons or enough to fill 9,000 city water towers holding one-half million gallons each.

Room for growth

The reservoir provides a municipal water supply estimated to satisfy the needs for a city population of 150,000—plenty of room for growth for the present city of 7,800.

Other major benefits of the Shoal Creek Project include annual savings of $140,000 through prevention of flood damages, and a public beach with swimming facilities for 3,300 persons, plus an attractive environment for new industries. It is a prime example of farm and city residents working together to fulfill needs for upland conservation treatment, municipal water supply, drainage, recreation, and flood control.

Litchfield moved quickly to make use of the Watershed Protection Act of 1954. Mayor Lewis Yaeger saw the opportunity to remedy the water shortage and gained citizen support for the project. The resulting 1,412-acre reservoir is named Lou Yaeger Lake.

A real bargain

"Our new city reservoir was a real bargain," Mayor Yaeger says. "It meant a $2 million improvement in our water supply, at a cost of only $0.75 a month for each residential user." Previously, residents paid $1.25 a month for the first 2,000 gallons. Now, the rate is $2, still one of the lowest city water rates in Illinois.

Registering enthusiasm for the project, Mayor Yaeger said, "We are positive this development will bring in new industries and we also expect to see economic gain for Litchfield for recreation."

Litchfield is developing a 600-acre city park around the lake. A public beach is the big feature. Water in the beach area is chlorinated. Several boat launching marinas will also be installed, and camping facilities and riding trails will be provided. About half of the cost will be paid with Federal funds under the Watershed Act. The rest will come from State and local sources.

Litchfield is also developing subdivisions on lake front property. So far, 3 subdivisions have been laid out with 34 lots in each. To date, 23 lots have been leased for a total of $65,000.

The larger project

Of course, the story of Litchfield and Lake Lou Yaeger is only part of the total Shoal Creek Project. The main purposes for the watershed project are flood and erosion control.

Annual estimated flood damages on 7,500 acres of agricultural land in the watershed lowlands were $134,419. This does not include damage to roads, bridges, and other public property. When the project is completed, flood damages will be reduced by 80 percent.

The project plan calls for three floodwater-retarding dams, two multipurpose structures for municipal water and floodwater control,

Lou Yaeger Lake gives Litchfield an abundant water supply, recreation facilities, flood protection, and a tool for enticing new industries into the area.

and 24 miles of channel improvement. So far, Litchfield's multipurpose structure and one floodwater-retarding dam have been completed. Part of the channel improvement is about to get underway.

The watershed project has accelerated conservation treatment on the uplands to control erosion, sedimentation, and runoff. With the help of increased Agricultural Conservation Program cost-sharing, more than 50 percent of the needed land treatment has now been applied. The original goal for minimum tillage has been surpassed, and farm pond construction has reached 90 percent of the estimated need.

The total estimated cost of the Shoal Creek Project is $7,128,856. Almost $3.5 million will come from watershed funds, and $3.6 million from loans and State and local money. Benefits from the project have been calculated to be $1.60 return for every dollar spent. ♦

The proportion of U.S. farmers working off the farm today is four times greater than it was in 1934. Most of them hold down full-time industrial jobs and farm in their spare time. ♦

Wind Erosion Halted at Australian Airbase

Australia, too, is finding soil and water conservation principles as helpful outside agriculture as they are on the farm.

An article in the *Journal* of the Soil Conservation Service of New South Wales, April 1966 issue, relates experiences at the Williamtown R.A.A.F. Base.

Main problems at the military airfield were caused by wind erosion of the sandy soils. Sand drifted over runways, roads, and drainage systems and hampered construction during expansion of facilities at the base. Incoming aircraft often could not distinguish the runway because of blowing sand.

Measures carried out with help of the New South Wales SCS included land grading, topsoiling, grass seeding, fertilization, and an irrigation system.

For a cost of about 8 cents a square yard, the Williamtown Base solved its erosion problems. As author B. C. Fleck put it, "the costs for soil conservation treatment were infinitesimal when compared to the value of the works protected." ♦

30 Patches of Vegetation

SAVING the best of Nature's past mantle of vegetation is a measure of conservation practiced by Mr. and Mrs. Harvey Pofcher and their youngsters, Amy and Eric.

About 40 acres of meadows and woods surround their post and beam house on Ames Hill, near Brattleboro, Vt.

Quite unusual is the lawn around the house. It measures 75 by 150 feet. Interesting features are 30 patches of goldenrod, black-eyed-Susans, sourgrass, hardhack, native ferns, yarrow, Queen Anne's lace, wild white clover, and bluegrass. These were salvaged from original vegetation.

The house was built on native pastureland. When the lawn was seeded, according to Mr. Pofcher, "I was kidding around one day and happened to leave these spots."

Lime and fertilizer are used sparingly on the seeded lawn to prevent its competing with the 3- by 3-foot islands of wildflowers and native grasses. No treatments are applied to the latter.

The Pofchers are pleased with their own way of keeping America beautiful.—ROBERT H. BRIGHAM, *Soil Conservationist, SCS, Brattleboro, Vt.* ♦

Amy Pofcher looks at some of the wild flowers, ferns, and native grasses on lawn.

With just a bit of showmanship...

Museum and Snack Bar Attract Customers, Help Sell Products

By Edward G. Konieczny
Work Unit Conservationist, SCS, Greenfield, Mass.

TAKE A FARM in an attractive setting. Add a sugar bush, Christmas trees, and blueberries. Mix with a bit of showmanship, and what do you have? A profitable farm business.

That's the way it has worked out for Linwood B. Lesure. His 700-acre farm, high in the rolling country at Ashfield, Mass., has more than 500 acres of woodland.

In an average year Lesure makes about 2,000 gallons of maple sirup and markets a variety of maple products.

From 50 acres he sells Christmas trees and boughs for making home decorations. He adds to the farm income by selling hay from 125 acres. "Pick them yourself" blueberries are the newest enterprise.

As a cooperator with the Franklin Conservation District and a certified tree farmer, Lesure takes good care of his 500-odd acres of woods. He thins the stands periodically. The trees that are removed are used for poles around the farm or for fuel in his home. He culls his woodland stands in winter. In May and October he shears the Christmas trees to give them the traditional holiday shape.

But Lesure's main interest is in maple sugar. That's where his showmanship comes in.

He has made his sugar house big enough to include a snack bar. There you can enjoy piping hot waffles dripping in pure maple sirup, just a few steps from where it is made. In this room, too, you can buy maple sirup in colorful tins of various sizes. Also on sale are maple cream, spread, and candy in different shapes. All are packed in eye-appealing packages of attractive design and a variety of sizes.

The candies, creams, and spreads are made by Mrs. Lesure in her tidy and efficiently arranged kitchen. She makes half a ton a year. Pretty and gracious girls from the neighborhood and nearby schools serve the customers.

Mr. Lesure has enclosed the side of his evaporating room with glass, so you can watch the operation that turns the sap into sirup.

That isn't all. Lesure has a display of tools, devices, and equipment that have been used in the maple sirup business from earliest days. His exhibit, worthy of a museum, attracts thousands of visitors a year.

It didn't take Lesure long to observe that many visitors like to photograph the picturesque maple sirup business. So he put out props, such as an old-fashioned pail hanging from a tree, sap slowly dripping into it. The props, linking the romantic past with the present, are close to the sugar house for the visitors' convenience.

"I've noticed a great increase in the number of people who come out with cameras," Lesure said.

Painters, too, mostly amateurs but occasionally a professional, visit the Lesure farm to put the attractive setting on canvas.

Because they can see the present manufacturing process and, from the exhibits, reconstruct the progress of sap gathering and of "sugaring" through the centuries, students from nearby schools add to their knowledge at the Lesure farm. Smith College students come in busloads to study the maple sirup business.

Linwood Lesure has one other sales asset. An interesting talker, he can hold your attention by his knowledge of the business, past and present. He likes people and enjoys explaining the sugaring business to anyone truly interested.

He belongs to the Berkshire Pioneer Maple Producers' Association and other trade groups that put out attractive sales literature.

Customers gather around the sales counter at the Lesure Farm Sugarhouse.

Linwood B. Lesure displays some of the products of his sugar business.

To stimulate business further he circulates recipes made up by Mrs. Lesure, on order blanks, price lists, and location maps.

This promotion and showmanship helps business. Thousands of people come to the Lesure farm with the sole intention of seeing maple sirup made, viewing the exhibits, taking photographs, or painting the sugar house. Few, however, leave without buying something. Once they have sampled the products, they are likely to become permanent customers. Lesure has many repeat patrons.

Like the maple products, Lesure retails his Christms trees at the farm. Families come out early in the fall and pick the trees they want. He gives each a gaily-colored tag. The patron fastens part of the tag to the tree of his choice and keeps the stub, with a matching number on it. When the family returns to claim its choice, the tree is located by matching the stub with the rest of the tag. Lesure or his son Robert cuts the tree.

Robert, a full partner in the enterprise, is the fifth generation to farm the place. ♦

Farmer Now Has Running Water

FOR the first time in their lives, the Jule McGills of Heidelberg, Miss., and their neighbors have running water for household and farm use.

In 1965, Jule McGill, a Negro farmer and cooperator of the Clarke County Soil Conservation District, secured an Economic Opportunity Loan through Farmers Home Administration and developed a spring that supplies his own needs and those of five neighbors.

He improved his pasture, bought a registered herd bull, and in 1966 with Agricultural Conservation Program cost-sharing assistance, he converted 16 acres on his 160-acre farm to bahiagrass.

There are few pond sites in the Beaverdam Community where the McGills live. Mr. McGill never had running water and never enough cash to install a water system. Wells are scarce throughout the area and are extra deep and expensive to install.

Many of McGill's neighbors, like himself, had been getting their water for household uses from open springs or branches, where the water is exposed to cattle, other animals, and insects.

About 700 feet below the McGill farmhouse, a seep offered a possibility. With engineering help from the Soil Conservation Service, Jule McGill and his neighbors built a water system at a cost of $260 for the use of the five farm families and their livestock. Rural Electrification Administration erected extra poles, wire, and a meter at the spring to provide adequate current for the pump.

As a result of this work four or five other families in the same community developed springs, and added the convenience of running water to their rural homes.—H. C. WILLIAMS, *Work Unit Conservationist, SCS, Quitman, Miss.* ♦

Schott (left) and Washington SCS Range Specialist Claude Dillon discuss conservation ranch plan. Note bunchgrass in left foreground.

Rotation Plan Improves Range

"KILLING sagebrush and then overgrazing the grass won't improve range," says Wilbert Schott, rancher and soil conservation district cooperator living near Odessa, Wash. "That's why I rest a different pasture each year between April 1 and June 30. This lets the grass store food and make seed."

Schott explains that pasture rested 1 year will be grazed first the next year, or from April to May 15. Then he moves his cattle out for 6 weeks and brings them back again after June 30.

Sagebrush is sprayed in the pasture being rested in spring. This allows the existing bunchgrass to make maximum use of the spring moisture released to it and encourages a faster recovery of the grass.

Five gallons of a herbicide mixture is aerially applied to each acre sprayed, at a cost of $4.75 an acre. The Agricultural Con-

servation Program pays 50 percent of the cost. Schott figures the sagebrush kill should be good for at least 20 years. "It pays," the rancher adds. "My sprayed and deferred range went from fair to excellent condition after a couple of years of proper use."—HANS A. KRAUSS, *Work Unit Conservationist, SCS, Odessa, Wash.* ♦

Farmer Retires From Row Crops to Trees

Would you plant trees on land worth $1,000 an acre?

Anthony J. Urkiel of South Deerfield, Mass., a cooperator with the Franklin Conservation District, is doing it.

Urkiel has an 8-acre field of fine sandy loam in the Connecticut River Valley. At different times he has produced onions, potatoes, and tobacco for 40 years.

In due time Urkiel will have the pleasure of thinning his woodland. He will sell some of the trees at Christmas time to adorn the hearths of many homes.

"I've retired from row crop farming," he said. "I could sell the land, but I like to see things grow and feel that I have had something to do with the growth."—EDWARD G. KONIECZNY, *Work Unit Conservationist, SCS, Greenfield, Mass.* ♦

Solving Pollution Problem

The Sarpy Soil and Water Conservation District of Nebraska entered into an agreement with the Sarpy County Board of Commissioners to help solve a pollution problem stemming from the dumping of solid wastes into natural watercourses.

The objectives of the $90,600 Demonstration Grant awarded to the board of commissioners are to show a new method of using an eroded gully area as a sanitary landfill. Plans call for constructing an earthfill drop-inlet dam across the gully below the waste-disposal area. ♦

Roadbank Stabilization

C. H. Whittington (left), SCS, Neshoba County, Miss., and Irby Goldman, county supervisor, study a severely eroded roadbank on the R. B. Moore farm. Tons of sediment was being deposited on good bottom-land pasture. In a cooperative venture, Moore provided materials, the county provided equipment, and SCS provided the know-how for seeding the roadbank.

Whittington, above, puts on the last of the mulch material. Previously, the roadbank had been fertilized, mineralized, and seeded to common bermudagrass and lespedeza serica. Result (below): enough cover to carry the area through the winter rains without erosion damage. These pictures won a statewide Mississippi conservation photo story contest.

A Conservation Profile:

Conservationist-School Teacher Practices What He Teaches

NOT ONLY does J. P. Johnson "practice what he preaches" but he also "preaches what he practices."

This Marshall County, Ala., farmer-school teacher and dedicated conservationist has been doing just that since he bought 278 acres from his dad in 1935.

"When I took over the farm it was worn out from growing cotton. I've spent my last 30 years rebuilding it," he said.

It was practically all in row crops, and erosion was taking its toll. The Soil Conservation Service helped him build terraces and gave him some kudzu for an erosion-control planting.

With this small beginning the appearance of the Tennessee Valley farm near Gunterville began to change. He planted land not suited for cultivation to grass and trees and plans to keep less than 100 acres in cultivation.

His principal crops of cotton, corn, and soybeans are planted on parallel terraced and contoured fields. About 118 acres are in pasture of Coastal bermudagrass and fescue, overseeded with white, ball, and crimson clover, that furnishes grazing for his 60 head of Hereford cattle.

The farm has increased in size to 383 acres. Mr. Johnson still holds the original deed, signed by President James K. Polk, on the 160 acres homesteaded by Johnson's great-grandparents in 1832.

As a teacher in the public schools of Marshall County, conservation was J. P. Johnson's favorite subject. During his 20-plus years of teaching he wove conservation of land and water resources into nearly all subjects.

Through the years he has been an undisputed leader of the conservation movement in his county and in Alabama. His leadership in soil conservation districts dates back to the organization of his own Northeast Alabama District in April 1941. In 1953, Mr. Johnson became a district supervisor and served as secretary-treasurer. In 1958, when Marshall County became a single county district, he was elected chairman of the board and still serves in that capacity.

In 1961-62, Johnson became area vice president of the Alabama Association of Soil and Water Conservation District Supervisors. In 1964 he served as State vice president, and in 1965 he was elected State president.

The district he heads won the Goodyear contest in 1964. During his tenure as chairman, the board has been active in conservation education and public relations activities, bought two cameras, a slide projector, a tape recorder, a bermudagrass planter, and a tree injector. The district also publishes a district newsletter.

Johnson's wife, also a schoolteacher, won the Governor's Conservation Awards Contest as the "Outstanding Teacher in Conservation" in 1965.

Even though the cattle and his 40 sows occupy most of his time now, he is still active in community service activities. When the Little Paint Creek Watershed Project was initiated, he helped to get land easements. He made talks to groups and conducted tours to help explain the program. When it was completed he was on hand for the dedication.

Soil stewardship has been a way of life for Mr. Johnson. He helped to plan and conduct many meetings, and soil stewardship materials purchased by the supervisors have been distributed to churches throughout the district.

Owner J. P. Johnson (left) and W. J. King, SCS work unit conservationist, discuss pasture improvement on the Tennessee Valley farm.

Although he has now retired from teaching, he remains active in community service. He is president of the Marshall County Cattlemen's Association, director of the Production Credit Association, a director of the Farm Bureau, and a member of the Methodist Church.

"I never miss a chance to talk to these groups about conservation," he comments.

J. P. Johnson's dedication and interest in public service have set an example that will not soon be forgotten, and through his personal dedication to youth education and resource conservation, he has inspired others to do even more in soil and water conservation. ♦

Quality of Environment

Care of the land to stabilize and cover the soil with healing vegetation and to assure a regulated flow of clear water is a fundamental requirement of quality in environment. ♦

Edward L. Felton

Conservationist of the Year

Edward L. Felton of Holland, Va., was honored as National Soil Conservationist of the Year in the National Conservation Achievement Program sponsored by the National Wildlife Federation and the Sears Roebuck Foundation.

A board of professional conservationists picked Felton from the list of State winners previously selected by the Federation's State affiliates. He was the choice of the Virginia Wildlife Federation.

Felton has been a member of the board of supervisors of the Peanut Soil and Water Conservation District, Virginia, for the past 20 years. He is a director in the National Association of Soil and Water Conservation Districts and is vice chairman of the State Soil and Water Conservation Commission.

He was instrumental in starting the first soil conservation district newsletter in Virginia. Felton played a major role in assisting with the development of a plan for water-resource use in his home county. He has installed a soil and water conservation program on his own farm. ♦

Soil Surveys and Land Use Planning. EDITED BY L. J. BARTELLI, A. A. KLINGEBIEL, J. V. BAIRD, AND M. R. HEDDLESON. *1966. Soil Sci. Soc. Amer. and Amer. Soc. Agron., Madison, Wis. 196 pp., illus. $2.00.*

One of the most significant recent developments in the application of conservation technology to modern resource problems is the expanded use of soil surveys. The "homely" soils inventory—once a guide for evaluating farm real estate, matching crops and soils, and determining the design of agricultural conservation measures—is now a full-fledged tool of the community planner.

In fact, says Dennis O'Harrow, executive director of the American Society of Planning Officials, "the soil capability analysis soon will be as basic to our art, and science, as the land use inventory, the traffic count, and the population projection."

This collection of papers presented at the 1965 annual meetings of the Soil Science Society of America and the American Society of Agronomy is broad in scope. The use of soils information is treated from the standpoint of the surveyor, the public official, the planner, the educator, and the planning consultant.

The application of soils data is explored in relation to community planning, urban development, regional planning, subdivision design, and highway planning and construction. Other uses are examined, such as recreation planning, the equalization of tax assessments, appraising soil productivity, and preparing zoning ordinances.

Throughout the book are many illustrations, charts, tables, and colored maps. These provide the detail needed to grasp the application of soils inventories to the complex problems of today's agricultural, suburban, and industrial growth. It becomes crystal clear, upon reading these papers, that "land has physical characteristics which often are more important than geographic location," as the book's introduction says.

It's an elementary point to conservationists, but one requiring constant and imaginative repetition. There is progress, however, for full recognition of the value of soils inventories to farm and city is on the horizon. The action of Congress in approving legislation to confirm the authority of the Soil Conservation Service to provide soils information and interpretations for nonagricultural uses is evidence of this trend.

But as recognition comes, so do demands for services. Yet less than half of our Nation's most basic natural resource has been inventoried. Although 903 million acres of the land area of the U.S. has been surveyed, 1.34 billion acres has not been mapped.

Sprawling development and waste of resources are the price of neglecting to use soils information in the community planning process—in town and in the countryside. Books like *Soil Surveys and Land Use Planning* can help us avoid paying this price.—DAVID G. UNGER, *Assistant Executive Secretary, National Association of Soil and Water Conservation Districts, Washington, D. C.*

Environmental Improvement (Air, Water, and Soil). EDITED BY RALPH W. MARQUIS. *1966. The Graduate School, U. S. Dept. of Agr., Washington, D. C. 105 pp.; paper, $1.50; cloth, $3.00.*

This book contains the texts of four lectures, and the comments of two "reactors" to each, presented in May 1966 under the auspices of the Graduate School, U.S.D.A., in the Thomas Jefferson Memorial Auditorium in Washington.

At a time of awakening interest in environmental quality, the distinguished scholars and public officials probed a broad range of questions bearing on the problem. The principal lectures are:

"Man and his Environment—Scope, Impact, and Nature," by Dr. René Jules Dubos, professor of the Rockefeller University, New York City, a microbiologist.

"Environmental Improvement—Institutional and Governmental Aspects," by Senator Edmund S. Muskie of Maine.

"Control of Environment—Economic and Technological Prospects," by John T. Middleton, director of the University of California's Statewide Air Pollution Research Center.

"The Future of Environmental Improvement," by Dr. S. Dillon Ripley, secretary of the Smithsonian Institution.—B.O.

Environmental Quality in a Growing Economy. EDITED BY HENRY JARRETT. *1966. Johns Hopkins Press, Baltimore (for Resources for the Future). 173 pp. $5.*

A dozen scholars explored the economic and social dimensions of natural resource quality at the 1966 Resources for the Future Forum.

The 12 papers are printed in a six chapter book giving us a beltway tour around the vast problem of obtaining the kind of environment we want.

What kind of environment do we want? Who pays for it and how much? Economists have answers, but so do administrators and politicians. Meanwhile, social scientists wonder how we can measure the public's preference and what kind of organizations are needed to maintain the quality of land, water, and air in the United States.

The book, academic in style and approach, leaves many questions unanswered. It shows how much needs to be done.—DUANE BALTZ, *Information Division, SCS, Washington, D. C.*

New Publications

Aerial-Photo Interpretation in Classifying and Mapping Soils. BY SOIL CONSERVATION SERVICE. *1966. USDA Agr. Hbk. 294. 89 pp., illus. $0.75.* Aerial photographs are widely used in soil surveying, farm and ranch planning, soil and forest conservation, irrigation and flood-prevention studies, timber estimates, crop-area measurement, highway planning, railroad and power-transmission location, geological research, and municipal planning.

This opportune handbook contains 15 main headings with subdivisions giving detailed instructions. Among the topics are aerial photography and surveys, photographic reproductions, perspective character of the photographs, correlating aerial photographic images with soils, soil maps for published soil surveys, photo interpretation in watershed-protection and flood-prevention programs, and a bibliography. Many aerial photographs and drawings illustrate the detailed instructions.

Action for Clean Water. *(1966). The Izaak Walton League of Amer., Glenview, Ill. 32 pp.* A citizen's guide dealing with the water-quality standards section of the Water Quality Act of 1965, resulting from the Citizens Workshops on Clean Waters sponsored by the Izaak Walton League with the cooperation of 13 other national organizations.

Bibliography on Socio-Economic Aspects of Water Resources. BY H. R. HAMILTON, D. H. OWENS, T. E. CARROLL, A. R. GLENN, AND B. A. GILMOUR. *1966. U. S. Dept. Int. Office of Water Resources Research. 453 pp.*

Soil Surveys

Wood County, Ohio. BY DONALD F. RAPPARLIE AND DONALD R. URBAN. *1966. 96 pp.; maps 4 inches to the mile (1:15,840).* Fieldwork by Paul E. Baldridge, Jr., Richard B. Jones, Kenneth L. Powell, Donald F. Rapparlie, John W. Lawrence, and John W. Van Dine.

Monroe County, Mississippi. BY L. C. MURPHREE, J. J. ANDERSON, R. M. FERGUSON, M. C. GARBER, M. G. MARTIN, K. H. MILLER, H. NICHOLS, AND R. E. FULGHAM. *1966. 123 pp.; maps 4 inches to the mile (1:15,840).*

AMERICA THE BEAUTIFUL COLOR LITHOGRAPHS

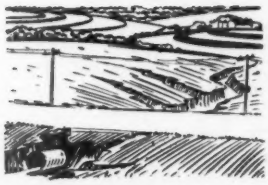
America The Beautiful—Indiana USDA, SOIL CONSERVATION SERVICE

FRENCH LICK WATERSHED RESERVOIR AND RECREATION AREA, ORANGE COUNTY SOIL AND WATER CONSERVATION DISTRICT

Full-color lithograph prints suitable for framing—one for each State, Puerto Rico, and the Virgin Islands—are available from the Superintendent of Documents for 10 cents each or $5.00 for set of 52. Obtain order blanks from your local SCS office or post office.

From the Administrator:

A No-Man's Land in Erosion Control



DESPITE the extensive system of soil and water conservation programs now available to American landowners and communities, there exist throughout the country many critical erosion areas for which there is no effective means of treatment.

Not the only ones, but perhaps most important, are eroding streambanks and roadsides and the abandoned spoil of surface-mined areas.

These numerous small and widely scattered areas discharge erosional debris, acid materials, and other pollutants onto lower-lying lands and into streams and reservoirs out of all proportion to their combined area.

They go untended not because we do not know what to do with them, or how to do what is needed. They are neglected because the treatments are generally so difficult and expensive that individual landowners do not find it worthwhile to do the work, and governmental jurisdictions lack the authority to do it at public expense.

The Soil Conservation Service has had much experience dealing with critical erosion areas in watershed and flood-prevention projects. It is necessary in these projects to eliminate major sources of sediment in order to protect reservoirs and water-control structures being installed at public expense. As part of the total watershed treatment plan, stabilizing of sediment-source areas can be cost-shared along with the structural measures.

Similarly, as part of Resource Conservation and Development projects, the stabilization of critical erosion areas usually can be accomplished with a combination of Federal and local assistance. Problems on Federal lands, of course, can be dealt with directly by the administering agencies.

But authorized watershed projects, RC&D projects, and such public lands include only a part of the national problem. It is estimated that there are some 2,125,000 miles of rural highways, 300,000 miles of eroding streambanks, and 2 million acres of nonfederally owned surface-mined areas that are serious sources of sediment and pollution beyond the reach of present corrective programs.

The President's Task Force on the Quality of the Environment recognized that soil sediment from erosion accounts for by far the greatest part of the suspended material in the Nation's rivers.

Sediment pollution increases water-treatment costs, depreciates the environment for fish, wildlife, and recreation, and destroys the natural beauty of streams and adjacent areas.

An Agricultural Research Service study in Georgia indicated that soil loss from unprotected roadsides ran as high as 356 tons per acre per year, or 16 pounds of sediment from each square foot of roadside. It is estimated that the Nation's roadsides now needing treatment are producing about 56,525,000 tons of sediment a year.

The President's Task Force identified eroding streambanks as another major source of sediment. This erosion is destroying land adjacent to stream channels valued at about $11 million annually and moving sediment into the streams at the rate of about 500 million tons a year. The problem is clearly national in scope.

The abandoned surface-mined areas in various parts of the country are an especially troublesome source of sediment and pollution. Although some States now have effective legislation requiring rehabilitation of areas currently being mined, and restoration programs are steadily improving, much of the damage done in the past still remains to be repaired.

These abandoned areas are nonproductive, eroding, and gullied liabilities to the communities where they occur. They produce sediment at the rate of up to 200 tons per acre. In addition, acid draining from the mined areas contaminates water in streams and reservoirs.

Enough experience has been gained in the limited programs already underway to show that mined areas and the resulting spoil banks can be effectively treated. It is, however, an expensive operation. The cost of applying vegetative practices alone ranges from $100 to more than $300 an acre. Also, in many cases large-scale grading operations and structural measures are needed. On many properties, onsite benefits cannot be expected to equal treatment costs. It is generally the sort of work that must be done by contract and cannot be expected to result from the usual cost-sharing available to farmers and ranchers.

Offsite benefits from sediment reduction and pollution control, however, justify action on sizable areas. Individual efforts are ineffective unless they are part of a coordinated plan. Group action is, therefore, the logical and practical approach.

It is time that soil conservation district supervisors, land use planning boards, and other local jurisdictions take a look at the problem of critical erosion areas that are being bypassed by going programs in their territories. New means of cooperative action are needed if we are to remove this blight from our rural environment.

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DIVISION OF PUBLIC DOCUMENTS
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When the Sap Rises in the Spring

Story on page 209

When the sap rises in the spring, and Linwood B. Lesure fires up the sugar vats, he starts a round of activity that brings a stream of tourists and customers to his Ashfield, Mass., farm, where he sells maple products and Christmas trees.

A cooperator with the Franklin Conservation District, he manages his 500 acres of woodland for sustained yield of a variety of products. ♦